LISOVSKIY, G.M.

UDC 629.78.048:581.12

QUANTITATIVE EVALUATION OF GAS EXCHANGE OF A CONTINUOUS CULTURE OF HIGHER PLANTS AS A LINK IN A LIFE SUPPORT SYSTEM

[Article by B. G. Kovrov and G. M. Lisovskiy; Moscow, Kosmicheskaya Biologiya i Meditsina, Russian, Vol [illegible], No [illegible], September–October 1972, pp 17-21, submitted for publication 6 January 1971]

Abstract: On the basis of experimental data concerning the pattern of age curves of wheat and radish photosynthesis a mathematical model was formulated to describe the gas exchange in continuous cultures of these plants and its integration with the life support system. Computer-aided evaluations revealed that the continuous culture need include plants of only four to seven ages to ensure an adequate stabilization of CO_2 consumption by higher plants within the life support system.

In a "man - higher phototrophs" system closed with respect to gas exchange an intensity of photosynthesis of higher plants which is nonuniform during the growing season does not agree with the relatively stable gas exchange of the system controller - man link. This alone forces one to abandon the traditional single-age ("synchronous") crop of plants over the entire allocated area if it performs gas exchange functions.

In addition, formation of the principal part of the food biomass in most crops occurs at the end of the growing season. This requires creation of a reserve of products "from harvest to harvest." The time-consuming operations of harvesting and a new seeding (planting) come close together in time, thereby creating a nonuniform work load on the crew.

The simplest way to overcome the mentioned difficulties is the creation in the system of a continuous (conveyor) crop, consisting simultaneously of plants of different ages. The possibilities of producing continuous crops of higher plants are now investigated in relation to problems in industrial hydroponics and for use in closed systems (L. I. Bronfman; V. G. Chuchkin; V. P. Dadykin; V. P. Dadykin, et al.; Lisovskiy, et al.).

JPRS 57577
15 Nov 72

LISOVSKIY, G. M.

Life Support System

COLEEN

SO: JPRS 53388
17 Jun 71

UDC 629.78.048:633.1

CEREALS AS A POSSIBLE COMPONENT OF THE AUTOTROPHIC LINK IN LIFE SUPPORT SYSTEMS

[Article by G. M. Lisovskiy and M. P. Shilenko; Moscow, Kosmicheskaya Biologiya i Meditsina, Russian, Vol 5, No 1, 1971, pp 22-25, submitted for publication 23 April 1970]

Abstract: On the basis of standard evaluations of higher plants selected for life support systems and experimental data concerning wheat productivity in an artificial environment, its biochemistry and compatibility with man, it is suggested that some cereals should be extensively studied to determine their possible use as a polyfunctional component of closed ecological systems.

The capacity for higher plants to ensure both gas and water exchange and the regeneration of the vegetable part of the human or animal diet in life support systems makes it desirable that they be thoroughly studied in this aspect. Researchers are faced primarily with the problem of selecting a limited number of plants from among the quarter of a million species of flowering plants known to botanists.

V. P. Dadykin (1968a) cites the following criteria for selecting plants for life support systems: high productivity, capacity for maximum satisfaction of man's needs for total mass and biochemical composition, mutual biological compatability, and absence of volatile emanations harmful to man. As additional criteria one can mention coincidence of the optimum temperature and air humidity for cultivated plants and man, as well as the simplicity in the methods and equipment for preparing food from the harvest and the possibility of preparing different dishes.

V. G. Chuchkin, et al., in selecting crops, uses as a point of departure the desirability of reproducing polysaccharides and the possibility of preparing various dishes and obtaining a balanced ratio of nutrients in the stored and reproduced foods. The weight characteristics of the higher plants

USSR

UDC 543.80 : 543.53

LISOVSKIY, I. P., and SMAKHTIN, L. A., Physicochemical Institute imeni L. Ya. Karpov, Moscow, State Committee for Chemistry

"Rapid Determination of Sodium in Organophosphorus Compounds by the Fast Neutron Activation Method"

Moscow, Zhurnal Analiticheskoy Khimii, Vol 25, No 8, Aug 70, pp 1629-1631

Abstract: The article describes a rapid method for the determination of sodium in organophosphorus compounds according to the reaction $^{23}Na(n, p)^{23}Ne$. The fast neutron source is an NG-160 neutron generator. Maximum flux $\sim 5 \cdot 10^8$ neutrons$\cdot cm^{-2} \cdot sec^{-1}$. The neutron generator is equipped with an electromagnetic shutter. The samples are irradiated in thin-walled polyethylene ampoules, which are moved between the neutron source and the measuring instrument by compressed air. The spectra of the irradiated samples are taken on a scintillation detector consisting of NaI(Tl) well-crystal and an FEU-49 photomultiplier. Results are given for sodium determination in three paral-

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USSR

LISOVSKIY, I. P., and SMAKHTIN, L. A., Zhurnal Analiticheskoy Khimii, Vol 25, No 8, Aug 70, pp 1629-1631

lel specimens of $NaOP(:O)(OC_6H_5)(OC_9H_{18})$. The average analysis time per specimen was 3-4 min. No corrections were made for self-shielding of specimens and standards during fast-neutron irradiation or for gamma-ray quantum absorption during measurement. The results show that it is possible to determine isotopes with a photopeak energy close to 0.51 Mev against a background of positron emitters in a well-crystal.

The authors thank I. K. RUBTSOVA for providing the specimens and A. B. DZEMITKEVICH for mounting and adjusting the neutron flux monitor.

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Analytical Chemistry

UDC 543.253

USSR

LISOVSKIY, I. P., and SMAKHTIN, L. A., Physicochemical Institute imeni L. Ya. Karpov, Moscow, State Committee for Chemistry

"Simultaneous Determination of Phosphorus and Chlorine in Organophosphorus Compounds by the Fast Neutron Activation Method"

Moscow, Zhurnal Analiticheskoy Khimii, Vol 25, No 8, Aug 70, pp 1625-1628

Abstract: The article describes a method for the simultaneous determination of phosphorus and chlorine in organophosphorus compounds by using fast neutron activation. An NG-160 neutron generator was used as the fast neutron source. Maximum fast neutron flux was $\sim 5 \cdot 10^8$ neutrons/cm^{-2}-sec^{-1}, but a smaller flux was used for irradiation. The neutron flux was turned on and off by means of an electromagnetic shutter with vertical arrangement of the electromagnet axis. The samples and standards were irradiated in threaded ampoules of stainless steel Kh18N10T, moved between the neutron generator and measuring instrument by compressed air. Irradiation, movement of ampoules, time delay be-

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LISOVSKIY, I. P., and SMAKHTIN, L. A., Zhurnal Analiticheskoy Khimii, Vol 25, No 8, Aug 70, pp 1625-1628

tween the end of irradiation and the beginning of measurement and the recording of the spectra were effected automatically. The phosphorus and chlorine content of a specimen was calculated by comparing the number of pulses in the photopeaks of the specimen and standards. The influence of chlorine on the results of phosphorus determination was studied.

The authors thank I. K. RUBTSOVA for providing the specimens.

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UDC: 621.371.33

USSR

LISOVSKIY, V. A.

"Propagation of Radio Waves in a Broadened UHF Range in Mining Installations"

V sb. Shakhtn. radiosvyaz' (Mining Radio Communication--collection of works) Moscow, 1970, pp 51-54 (from Rzh-Radiotekhnika, No. 3, March 71, Abstract No. 3A238)

Translation: A theoretical investigation is conducted in the use of tubes with circular cross section and walls of infinite thickness as models of a medium. Values of attenuation factors for waves in the 200-600 MHz range for different rock parameters were theoretically obtained. The measurements confirmed the results of the computations. One table. N. S.

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UR 0482

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Soviet Inventions Illustrated, Section I Chemical, Derwent, 3-70

236371 MAGNETIC IRON SEPARATOR consists of a bank of magnetic rollers, 1 forming a magnetic conveying system, two unloading rollers 2, and the frame on which the conveying system is mounted 3. The incoming raw materials containing ferromagnetic material are admitted from the conveyor belt 4. Since the magnetic rollers are inclined at an angle, the non-magnetic materials roll off and are directed to their own receiver. The magnetic particles adhere to the rollers and are conveyed to one side, where they are ejected into their own container. The design is claimed to reduce the amount of power required to carry out the separation. The top diagram shows the side view, whilst the lower diagram shows the separator in plan view. 7.5.67. as 1151686/22-3. P.A LISOVTSEV et al. "Gidromashugleobogashchenie" Planning & Design Inst. (18.6.69.) Bul.7/3.2.69. Class 1b. Int.Cl. B03b.

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AUTHORS: Lisovtsev, P. A.; Il'chenko, A. I.; D'yakov, G. I.; Prozorov, Yu. P.; Gal'chenko, N. S.; Korneyev, N. V.; Sagaydakovskiy, V. G.

Gosudarstvennyy Proyektno-Konstruktorskiy Institut "Gipromashugleobogashcheniye"

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19741225

LISOYVAN, V.I.

JPRS 59068

6-73

3

VI-4b. NITROGEN SEGREGATIONS IN DIAMOND

[Article by Ye. V. Sobolev, V. I. Lisoyvan, A. P. Yeliseyev, Novosibirsk; Novosibirsk, III Simpozium po Protsessam Rosta i Sintezo Poluprovodnikovykh Kristallov i Plenok, Russian, 12-17 June, 1972, p 72]

Various methods (optical, x-ray, electron microscope, analytical) were used to establish the existence of natural diamonds of nitrogen segregations of two types in crystals: in the cubic and octahedral planes. The manifestations of the segregations are distinguished from the manifestations of the point centers: a) by variation in the properties with variation in size, b) by separation of two different zones — characteristically defect or a middle zone and a transition (edge) zone. The edge zone is of the dislocation type, at the center N_s (100) with a system of broken C-C bonds, at the center N_s (111) apparently without a system of broken C-C bonds but with singularities. The singularities of the edge zones of both segregations can serve as traps just as the centers of recombination, exhibiting thermal luminescence and phosphorescence. A complete model of the centers (with the edge zone) is presented which describes all the known properties. The center N_s (100) of lenticular shape and the stresses introduced into the crystal more than at the centers N_s (111) determine the color of the peaks on the thermalluminescence curves and other effects. The segregations can be accompanied by other centers exhibited in the luminescence. It is demonstrated that the segregations are formed during growth of the crystal; the process of their formation can be represented as polymerization of nitrogen vapor.

Structure		Infra-red cm^{-1}	Ultra-violet Å	Luminescence Å	X-H	Electron micro-scope	Remarks
N N N	Center	1110 1100 1175 1331	2365	2365	No effect on t-p Weak effect in diffuse scattering	Loops in (111)	Accompanied by NVN(S_2), N_3V, ⊥: C_N = $7.6 \cdot 10^{18} K_{1175}$ $1.2 \cdot 10^{18} K_{2365}$.
N N N	Edge		2400	λ > 4150 (300°K) 4615 (80°K)			

LISOVYAN, V. I.

VI-c. DISTRIBUTION OF IMPURITY CENTERS IN DIAMOND

[Article by Ye. S. Sobolev, V. I. Lisovyan, V. F. Solov'yev, Novosibirsk; Novosibirsk, III Simpozium po [illegible] Poluprovodnikovykh Kristallov i Plenok, Russian, 12-17 June, 1972, p 73]

Various methods (infrared and ultraviolet absorption, photographic and x-ray luminescence, double refraction, x-ray topograms, local measurement of the parameter) were used to study the distribution of impurity centers in diamond crystals of various types. It was established that the same centers can have both sectorially zonal and zonal distribution (the centers N_2, N_2, Ni (111)). The most detailed study was made of the natural diamond crystal type I. Here, the fine zonality with respect to the N_2 center, the zonal distribution in N_3V with isolation of the fine zones, the zonal distribution of the center Ns (100) both with respect to content and with respect to size of the segregations. The latter fact permits the conclusion to be drawn that the formation of the segregation centers takes place during the crystal growth process. The study of the variation of the parameter shows that its magnitude is determined exclusively by the concentration of the N_2 centers. The double refraction figures are also connected with the distribution of the N_2 centers; the most intense bands are attributed to the boundaries of the zones with the greatest N_2 concentration drops. The zonality of the zones under the effect of x-rays is related in this crystal to the distribution of the N_2 centers (an inverse relation). In crystals of the intermediate type the zonality in the x-ray emulsion corresponds to the distribution of the centers Ns (111) -- a direct relation. Beginning with the dislocation nature of the centers of x-ray luminescence, the conclusion is drawn regarding the inoculating effect of the N_2 centers on the formation of the growth dislocations.

The analysis of the material obtained permits the conclusion to be drawn that:
a) comparison of the pictures of the zonal distribution of different properties in the entire series of cases is not a proof of their belonging to the same center, but it is determined by the close interrelation of the different centers (accompanying, subordinate, and so on); b) the nitrogen impurity enters the crystal during the growth process; the capture is determined by the growth rates; c) the different nitrogen centers are formed during the growth process; the predominant segregation of any of them is determined by the growth conditions of the crystal.

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USSR

UDC: 534.1:629.7.0.035

LISS, A. YU. and MARGULIS, G. U.

"Using the Integrating Matrices Method for Calculating the Natural Vibrations of the Blade of an Airscrew Taking Into Consideration Bending in Two Planes and Torsion"

Kazan', Izvestiya Vysshikh Uchebnykh Zavedeniy, Aviatsionnaya Tekhnika, No 1, 1973, pp 30-37

Abstract: The authors present a method for calculating the natural vibrations of a twisted beam (blade) in a centrifugal force field taking into consideration bending in two planes along with torsion. The method is based on the replacement of natural vibration differential equations for a beam by a system of algebraic equations by means of integrating matrices which are a modification of M.B. Vakhitov's integrating matrices. A comparison of the computation results with the exact solution shows the high degree of accuracy of the developed methodology.

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1/2 021 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--ANISOTROPY OF THE PROPERTIES OF FILLED POLYETHYLENE DURING INJECTION MOLDING -U-

AUTHOR-(04)-LISTKOV, V.M., YUZHIN, V.M., DAMINOV, YU.F., MARTYNOV, M.A.

COUNTRY OF INFO--USSR

SOURCE--PLAST. MASSY 1970, (5), 46-9

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--PLASTIC INJECTION MOLDING, POLYETHYLENE, ANISOTROPY, FILLER, MECHANICAL STRENGTH

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/0910 STEP NO--UR/0191/70/000/005/0046/0049

CIRC ACCESSION NO--AP0134639

UNCLASSIFIED

2/2 021 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0134639

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ADDN. OF 20PERCENT TALC, MICA, OR SILICA POWDERS TO HIGH-D. POLYETHYLENE (I) DECREASES THE ANISOTROPY OF I CASTINGS. THE FILLERS REDUCE THE MOBILITY OF I MOLS. AND PREVENT THEIR ORIENTATION DURING MOLDING. ASBESTOS FILLER CAUSES SOME ALIGNMENT OF I MOLS. ALONG ITS FIBERS AND INCREASES ANISOTROPY. THESE FILLERS DO NOT INTERFERE WITH THE WORKABILITY OF I MIXES OR ITS CRYSTALLINITY. CASTINGS CONTG. THESE FILLERS HAVE NEARLY THE SAME MECH. STRENGTH AND SHRINKAGE IN ALL DIRECTIONS.

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USSR UDC: 621.372

LISTOV, Yu. A.

"Problems in the Design of Amplification-Conversion Devices"

Tr. Mosk. aviats. in-ta (Works of the Moscow Aviation Institute), 1970, vyp. 220, pp 93-98 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5A54)

Translation: Taking the general calculation of irreversible processes in a conversion element as a basis, the principle of least action is used for deriving a system of equations which describes the behavior of any linear energy converters regardless of the nature of the physical process inside the converter. Bibliography of three titles. M. S.

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USSR UDC 621.762.001.541.1:669.01.84

KARPINOS, D. M., and LISTOVNICHAYA, S. P., Institute of Problems of Materials Science, Academy of Sciences Ukrainina SSR

"Interaction of Certain Oxide Diffusion Barriers with the Matrix Phase and Hardening Elements of Materials Reinforced with Fibers"

Kiev, Poroshkovaya Metallurgiya, No 1, Jan 74, pp 101-107

Abstract: An attempt was made to use oxide, one micron thick, as diffusion barriers to prevent the formation of brittle intermetallides. This was done by studying the interaction of the matrix phase with reinforced-fiber hardening elements, being protected by the diffusion barriers. Silicon dioxide, aluminum oxide, and aluminosilicate coatings were used as the diffusion barriers, produced by electron-beam vaporization or high-frequency discharge. From tests using the above-mentioned coatings on steel Kh18N9T and Co, Ni, nichrome, Mo, and W it was found that the temperature stability of these coatings increased in the order given, i.e., the thermal stability of 0.35 micron films of silicon dioxide increased with the order of the steel and metals listed above, aluminum oxide coatings were stable at higher temperatures which increased in the order of the metals and steel listed above, e.g., 1100-1200° C for

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USSR

KARPINOS, D. M., and LISTOVNICHAYA, S. P., Poroshkovaya Metallurgiya, No 1, Jan 74, pp 101-107

for Kh18N9T up to 1500-1600 for tungsten, with a lower thermal stability noted for the aluminosilicate coatings. Annealing of the coated materials produces different coating thicknesses depending on the compatibility of the coating and matrix and the fiber used. The major factor involved is the degree to which mass transfer of the coating penetrates the substrate. It was concluded that the use of diffusion barriers opens new avenues for use in the development of materials reinforced with fibers. Four figures, three tables, 18 bibliographic references.

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USSR UDC 535.853.4

KARPINOS, D. M., LISTOVNICHAYA, S. P., AYVAZOV, V. YA.

"Reflecting Attachment for an Infrared Spectrometer"

Moscow, Pribory i Tekhnika Eksperimenta, No 6, 1971, pp 190-191

Abstract: The known devices for obtaining the infrared reflection and transmission spectra of thin films are highly complex. A simple design of an attachment for studying the reflection and transmission spectra of thin films at angles of incidence close to 78° for single and double-beam devices is described. The device makes it possible to obtain spectra for films the thickness of which is much less than the wavelength. This provides information about the film structure and makes it possible to study the boundary interaction of the contacting phases of a different physical-chemical nature.

The investigated sample is attached at an angle of 75-78° to the axis of the incident radiation as the mirror closest to the entrance slit of the monochromator. The other two mirrors are aluminum plated glass plates made of KF-8 glass. All three mirrors are installed in a special mounting which is attached in a sealed tube of an illuminator. The slit is covered by a rubber plate. To increase the sensitivity of the method (isolate the radiation component parallel to the plane of incidence), a polarizer -- a diffraction

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KARPINOS, D. M., et al., Pribory i Tekhnika Eksperimenta, No 6, 1971, pp 190-191

grating applied to an aluminum-coated polyethylene film -- is added to the attachment.

In the spectra of SiO_2 films, in addition to the usually observed absorption band, new absorption bands were detected in the 1,300 and 500 cm^{-1} region which are absent in the spectra of films applied to monocrystalline Si. These new bands are explained by the polarizing effect of the substrate. Analogously, in the 1,000 cm^{-1} region, an absorption peak was detected for Al_2O_3 films obtained by the high frequency deposition method.

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UDC 669.28.051

USSR

YEREMENKO, V. N., LISTOVNICHIY, V. YE., OPALOVSKIY, A. A., and FEDOROV, V. YE.

"Physicochemical Investigation of the System Molybdenum-Sulfur"

V sb. Khal'kogenidy (Chalcogenides--collection of works), Vyp 2, Kiev, "Naukova Dumka", 1970, pp 92-97 (from RZH-Metallurgiya, No 11, Nov 70, Abstract No 11G181)

Translation: A physicochemical investigation is conducted of the system Mo-S by the methods of thermography, radiography, metallography, dilatometry, and resistometry. It is established that in the region of concentration up to 26 wt. % S, a two-phase field of crystallization of Mo + Mo_2S_3 with a 1540° temperature of the "solidus" line is realized. 2 ill., 2 tables.

S. Krivonosova

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1 USSR UDC 621.791.76:621.7.044.2:669-419.4:621.643.4.065

LISUKHA, G. P., Engineer, KHEYFETS, M. Ye., Engineer (Volgograd Ship Building Plant), KAZAK, N. N., Engineer, OVCHINNIKOV, A. P., Engineer, SAKHNOVSKAYA, Ye. B., Engineer, and TRYKOV, Yu. P., Candidate of Technical Sciences (Volgograd Polytechnical Institute)

"Efficiency of Bimetallic Steel-Aluminum Adapters Produced by Explosive Welding"

Moscow, Svarochnoye Proizvodstvo, No 10, Oct 70, pp 20-22

Abstract: Tests were made of a composite material produced by explosive welding of St.4S and Kh18N10T steels 8 mm thick to a cladding layer of AMg6 aluminum alloy 6 mm thick with a sublayer of AD1 technical aluminum 1.5 mm thick acting as a plasticity buffer. The tests showed that the bimetal AMg6 + St.4S has an average layer-separation resistance of 9.9 kg/mm^2 and a shear strength of 7.6 kg/mm^2, while AMg6 + Kh18N10T has strengths of 7.0 and 6.8 kg/mm^2, respectively. The AMg6 + steel produced can be used for the manufacture of adapters of various shapes for the production of steel-aluminum welded structures. The proper sequence for welding of a steel-aluminum structure to avoid overheating of the bimetal

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USSR

LISUKHA, G. P., et al, Svarochnoye Proizvodstvo, No 10, Oct 70, pp 20-22

over a broad range of welding currents was determined. If the optimal welding current values determined are exceeded, a sharp decrease in strength of the welded joints involving Kh18N10T steel occurs, as a result of its higher tendency toward overheating than St.4S.

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1/2 043 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--INFRARED EQUIPMENT OF METEOR SYSTEM SATELLITES -U-

AUTHOR--VETLOV, I.P., YEREMIN, V.P., LISTRATOV, A.V., RODIONOV, V.T.

COUNTRY OF INFO--USSR

SOURCE--METEOROLOGIYA I GIOROLOGIYA, 1970, NR 4, PP 80-91

DATE PUBLISHED--------70

SUBJECT AREAS--SPACE TECHNOLOGY, NAVIGATION

TOPIC TAGS--IR SENSOR, ATMOSPHERIC CLOUD, SPACECRAFT CARRIED EQUIPMENT, METEOROLOGIC SATELLITE/(U)METEOR METEOROLOGIC SATELLITE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1987/1041 STEP NO--UR/0050/70/000/004/0080/0091

CIRC ACCESSION NO--AP0104439
UNCLASSIFIED

2/2 043 UNCLASSIFIED PROCESSING DATE--13SEP70

CIRC ACCESSION NO--AP0104439

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. INFRARED EQUIPMENT OF METEOR SYSTEM SATELLITES DESTINED FOR TRACING THE CLOUD DISTRIBUTION OVER THE HIGH AND DAY SIDES OF THE EARTH IS BEING DESCRIBED. PRINCIPLES OF OPERATION OF THE EQUIPMENT, AN OPTICAL SCHEME OF THE ON BOARD RECEIVING DEVICE, A BLOCK SCHEME OF THE GROUND PHOTO RECORDING DEVICE, THE BASIC PARAMETERS AND CHARACTERISTICS OF THESE DEVICES ARE CONSIDERED. THE RESULTS OF INTERPRETATION OF THE INFORMATION OBTAINED ARE DISCUSSED.

UNCLASSIFIED

USSR

UDC 532.529

AVETISYAN, I. A., ZAVARZINA, N. A., LISTROV, A. T.

"Invariant-Group Properties of the Equations of Motion of a Liquid With Bubbles"

Sb. nauch. tr. fak. prikl. mat. i mekh. Voronezh. un-ta (Collection of Scientific Works of the Faculty of Applied Mathematics and Mechanics of Voronezh University), 1971, No. 1, pp 109-117 (from RZh-Mekhanika, No 3, Mar 72, Abstract No 3B953)

Translation: The flow of a mixture of liquid and gas bubbles is discussed. Although the initial equations are written in the approximation of a two-velocity continuous medium, subsequently the rates of both phases are considered as coinciding. The equations finally obtained take into account in particular the relaxation effects associated with oscillations in the volume of the bubbles, where pulsations in the bubbles are considered isothermal. Further considered are linearized equations of the quasi-one-dimensional nonstationary flow of the mixture in a tube of variable cross section $F = F(x)$ and the invariant-group properties of the corresponding differential equations are investigated. H-invariant solutions are then obtained and optimal systems of operators are described that are permitted by the initial system of equations in three cases, when the

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USSR

AVETISYAN, I. A., et al, Sb. nauch. tr. fak. prikl. mat. i mekh. Voronezh. un-ta, 1971, No. 1, pp 109-117

following condition is fulfilled:

$$f'' + ff' = 0 \left(f = \frac{1}{F} \frac{dF}{dx} \right)$$

and when this condition is not fulfilled. The solutions obtained describe in a one-dimensional approximation the flow of the mixture of liquid and bubbles in tubes of varying cross section. The second part of the article discusses under the same assumptions two-dimensional (plane) nonstationary flow. A Laplace transformation with respect to time is applied to the initial equations and then the equation for the representation of pressure is investigated and solved by invariant-group methods. 6 ref. A. N. Krayko.

2/2

1/2 021 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--LOAD CARRYING CAPACITY OF A STRUCTURE MADE FROM AN ISOTROPIC MATERIAL WITH DIFFERENT YIELD POINTS WITH ALLOWANCE FOR THERMAL EFFECTS

AUTHOR-(02)-LISTROVA, YU.P., POTAPOV, V.N.

COUNTRY OF INFO--USSR

SOURCE--MASHINOSTROENIE, NO. 2, 1970, P. 5-8

DATE PUBLISHED-------70

SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--SHELL STRUCTURE, THERMAL EFFECT, SHELL OF REVOLUTION, ISOTOPIC PROPERTY, YIELD STRESS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1985/0317 STEP NO--UR/0418/70/000/002/0005/0008

CIRC ACCESSION NO--AP0100804

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--18SEP70

2/2 021

CIRC ACCESSION NO--AP0100804

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONSTRUCTION OF A LIMITING YIELD SURFACE FOR SYMMETRICALLY LOADED SHELLS OF REVOLUTION MADE FROM AN ISOTROPIC IDEALLY RIGID PLASTIC MATERIAL HAVING DIFFERENT YIELD POINTS UNDER TENSION AND COMPRESSION. THE ANALYSIS IS BASED ON THE ASSUMPTION THAT THE YIELD POINTS VARY ACCORDING TO A POWER LAW ACROSS THE THICKNESS OF THE SHELL. THE UPPER CRITICAL LOAD IS DETERMINED FOR A STRUCTURE IN THE FORM OF TWO CYLINDERS COUPLED BY A SPERICAL SEGMENT.

UNCLASSIFIED

USSR

UDC 621.376.223.029.65/.66

LISTVIN, V. N., and POTAPOV, V. T.

"A Semiconductor Modulator of the Millimeter and Submillimeter Bands"

Moscow, Radiotekhnika i Elektronika, Vol 16, No 7, Jul 71, pp 1222-1224

Abstract: The paper presents the results of an experimental study of a semiconductor modulator based on N-type indium antimonide at 4.2°K in the millimeter and submillimeter bands (0.8-8.0 mm). In compensated specimens of N-type InSb at 4.2°K, the impurity band can be separated from the conduction band. Then application of an electric field to the specimen leads to impact ionization of the impurity levels and an increase in the number of electrons in the conduction band, as well as changing the mobility of the electrons. At the same time, there is a change in the electrical conductivity of the specimen and the coefficient of absorption of the emission. This is the effect on which the proposed emission modulator is based. Relationships are found for the coefficient of modulation as a function of the amplitude of the modulating voltage and the emission wavelength. The modulator may be used in radiometers for the submillimeter band. The authors thank V. V. Rudakov for assistance in conducting the experiment, and V. V. Migulin and V. I. Trifonov for discussing the results.

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USSR

UDC 615.23:547.789.5

MIRYAN, N. I., TRINUS, F. P., IZOTOVA, P. V., FADEICHEVA, A. G. and LISUNKIN, YU. I., Kiyev Scientific Research Institute of Pharmacology and Toxicology

"Biological Activity of Some Thiazole Derivatives"

Moscow, Khimiko-Farmatsevticheskiy Zhurnal, Vol 7, No 8, Aug 73, pp 17-20

Abstract: Some thiazole derivatives act as breathing stimulators and as antagonists to morphine, nicotine and to barbiturates. One of the more active agents of this group is 2,4-diamino-5-phenylthiazole hydrochloride (I) -- the so called daptazol. A simplified synthetic method for this compound with slightly improved yield has been developed, and using this method, two new derivatives were synthesized: 2,4-diamino-5-(p-fluorophenyl)thiazole hydrochloride (II), and 2-4-diamino-5-(o-nitrophenyl)thiazole hydrochloride (III). Biological studies were carried out which showed that replacement of the amino groups in the 2 and 4 positions of the thiazole ring by hydroxyl groups resulted in disappearance of the characteristic antimorphine action. The toxicity was increased. Introduction of substituents in the phenyl ring does not change the hypotensive activity of these compounds.

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UDC 615.214+615.384

USSR

KOTENKO, S. I., and LISUNKIN, Yu. I., Kiev Scientific Research Institute of Pharmacology and Toxicology

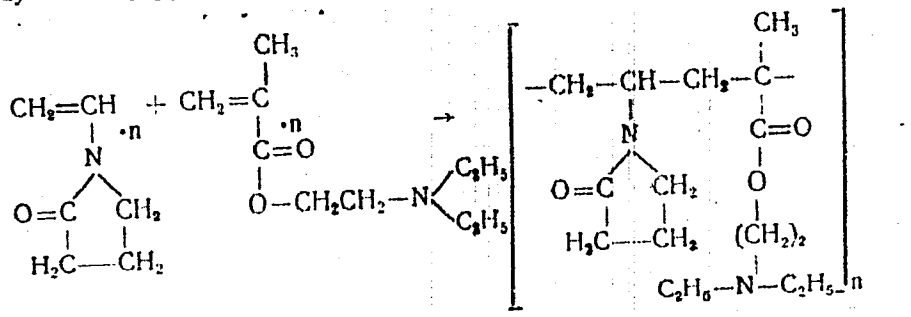
"New Biologically Active Copolymers of N-Vinylpyrrolidone"

Kiev, Farmatsevtichniy Zhurnal, Vol 26, No 3, May-Jun 71, pp 82-84

Abstract: The methods of derivation and the pharmacological and biological properties of the copolymer of N-vinylpyrrolidone with diethylaminoethyl methacrylate (VP-DEAEMAK) (I), its quaternary salts VP-DEAEMAK hydrochloride (II), VP-DEAEMAK methiodide (III), VP-DEAEMAK ethiodide (IV), VP-DEAEMAK propiodide (V), and copolymer of vinylpyrrolidone with methacrylic acid (VI) were studied.

USSR

KOTENKO, S. I., and LISUNKIN, Yu. I., Farmatsevtichniy Zhurnal, Vol 26, No 3, May-Jun 71, pp 82-84



Copolymer I is a colorless, thermoplastic substance soluble in all solvents with the exception of petroleum ether and heptane. It is readily quaternized; its quaternary salts differ from copolymer (I), they are insoluble in ethyl alcohol, acetone, and benzene. The pharmacological and biological properties of preparations II and V are comparable to those of copolymer VI. The sodium salt of VI administered intraperitoneally to white rats

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USSR

KOTENKO, S. I., and LISUNKIN, Yu. I., Farmatsevtichniy Zhurnal, Vol 26, No 3, May-Jun 71, pp 82-84

in a dose of 1-2 milligrams per kilogram body weight (ml/kg) reduced arterial pressure and diminished respiratory amplitude; administered in a dose of 20 mg/kg the preparations reduced pressure by 24±5 percent, with the depressor effect failing to respond to the injection of atropine. Preparations III, IV, and V administered to the animals also produced a hypotensive effect, and in addition induced a curare-like effect on the neuromuscular synapses. The investigations thus established that the studied copolymers and their quaternary salts are hypotensive in their action and to some degree affect neuromuscular transmission.

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USSR

VERSHIGORA, A. Ye., DYACHENKO, S. S., LISUNKINA, I. K., MORGUNOV, I. N., NOGACHEVSKIY, I. I., TEREKHOV, S. N., CHERNUSHENKO, Ye. F., and YAGUD, S. L., Editors, Ministry of Health, Ukrainian SSR

Immunologiya. Respublikanskiy mezhvedomstvennyy sbornik (Immunology. Republic Interdepartmental Collection), No 5, "Zdorov'ya," Kiev, 1972

Translation: Annotation: Articles included in the collection deal with the most pressing problems of theoretical and practical immunology, viz., mechanism of the formation of antibodies and immunological reactivity, allergy and clinical and experimental immunopathology, specific prophylaxis, and reactogenicity of vaccines and postvaccinal complications. Works aimed at devising methods of immunological investigations help to solve problems of modern immunology.

The previous four issues of this collection were published under the title of "Voprosy Immunologii" (Problems of Immunology).

The collection is of interest to scientific workers, practitioners of various specialties, and to senior students of medical institutes.

191 pages. 52 Russian articles with Russian abstracts.
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USSR

VERSHIGORA, A. Ye., et al., Immunologiya. Respublikanskiy mezhvedomstvennyy sbornik (Immunology. Republic Interdepartmental Collection), No 5, "Zdorov'ya," Kiev, 1972

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VERSHIGORA, A. Ye., et al., Immunologiya. Respublikanskiy mezhvedomstvennyy sbornik (Immunology. Republic Interdepartmental Collection), No 5, "Zdorov'ya," Kiev, 1972

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USSR

VERSHIGORA, A. Ye., et al., Immunologiya. Respublikanskiy mezhvedomstvennyy sbornik (Immunology. Republic Interdepartmental Collection), No 5, "Zdorov'ya," Kiev, 1972

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USSR

VERSHIGORA, A. Ye., et al., Immunologiya. Respublikanskiy mezhvedomstvennyy sbornik (Immunology. Republic Interdepartmental Collection), No 5, "Zdorov'ya," Kiev, 1972

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USSR

VERSHIGORA, A. Ye., et al., Immunologiya. Respublikanskiy mezhvedomstvennyy sbornik (Immunology. Republic Interdepartmental Collection), No 5, "Zdorov'ya," Kiev, 1972

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USSR

VERSHIGORA, A. Ye., et al., Immunologiya. Respublikanskiy mezhvedomstvennyy sbornik (Immunology. Republic Interdepartmental Collection), No 5, "Zdorov'ya," Kiev, 1972

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USSR

VERSHIGORA, A. Ye., et al., Immunologiya. Respublikanskiy mezhvedomstvennyy sbornik (Immunology. Republic Interdepartmental Collection), No 5, "Zdorov'ya," Kiev, 1972

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USSR

VERSHIGORA, A. Ye., et al., Immunologiya. Respublikanskiy mezhvedomstvennyy sbornik (Immunology. Republic Interdepartmental Collection), No 5, "Zdorov'ya," Kiev, 1972

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USSR

VERSHIGORA, A. Ye., et al., Immunologiya. Respublikanskiy mezhvedomstvennyy sbornik (Immunology. Republic Interdepartmental Collection), No 5, "Zdorov'ya," Kiev, 1972

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USSR

KUREYCHIK, V. M. and LISYAK, V. V.

"Placement of Modules in Cells During Machine Planning of Digital Devices"

Tr. Taganrog. Radiotekhn. In-ta [Works of Taganrog Electronic Engineering Institute], 1973, No 37, pp 172-184 (Translated from Referativnyy Zhurnal Kibernetika, No 9, 1973, Abstract No 9V624).

Translation: An algorithm is suggested for the placement of modules in cells, consisting of three stages: successive placement, iterational placement and a stage of additional adjustment of connections constructed. The initial information for the operation of the algorithm is a matrix. The algorithm is fast-acting and easy to program for a digital computer. Data from a program written for the Minsk-22 computer are presented.

Authors' view

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USSR

MELIKHOV, A. N., KUREYCHIK, V. M., LISYAK, V. V.

"Algorithm of Placement of a Graph on a Plane"

Teor. Kibernetika [Theoretical Cybernetics -- Collection of Works], Kiev, 1971, pp 48-65 (Translated from Referativnyy Zhurnal, Kibernetika, No 1, 1973, Abstract No 1 V784 by O. Belkin).

Translation: One problem of topological planning of digital automata is studied -- the problem of placement of modules in cells considering the minimum total length of connecting wires. Known algorithms of placement of modules can be divided into two types: sequential and iterational. The former, in addition to simplicity of realization and high speed, have low accuracy. Iterational algorithms, although they are slower, yield more precise results, the final result depending on the initial placement of the modules. An algorithm suggested for production of the initial placement of modules utilizes sequential methods, and minimization of the total length of connections is achieved by iterational methods. The algorithm studied was used in a small system for planning the topology of digital integrated circuits and structures. The corresponding program, written in LYaPAS, allows graphs containing up to 200 points to be studied. The total time of solution of the problem of placement of 100 modules is approximately 1 hour (on the Minsk 22 computer).

USSR UDC 8.74

MELIKHOV, A. N., KUREYCHIK, V. M., LISYAK, V. V.

"An Algorithm for Laying out a Graph on a Plane"

Kiev, Teor. kibernetika--sbornik (Theoretical Cybernetics--collection of works), 1971, pp 48-65 (from RZh-Matematika, No 1, Jan 73, abstract No 1V784 by O. Belkin)

Translation: The paper deals with one of the problems of topological projection of digital automata -- the problem of arranging modules in cells with regard to the minimum overall length of connecting wires. Conventional algorithms for arrangement of modules can be broken down into two types: sequential and iteration. Algorithms of the first type are simple to realize and fast, but are not highly precise. Iteration algorithms, although slower, give more accurate results, the final result depending on the initial arrangement of the modules. The proposed algorithm for initial arrangement of the modules utilizes sequential methods, and the overall length of the connections is minimized by iteration methods. This algorithm was used in a small system for design of the topology of digital integrated circuits and structures. The corresponding program in LYAPAS language can handle graphs containing up

USSR

MELIKHOV, A. N. et al., Teor. kibernetika, 1971, pp 48-65

to 200 vertices. The overall time for solution of the problem of arranging 100 modules is approximately one hour (on the "Minsk-22" digital computer).

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USSR

ANDRUSHCHUK, A. O., MOL'CHENKO, E. F., RADCHENKO, N. O., and LISYANA, T. O.

"Quantitative Characteristics of Immunoglobulins During Acute Respiratory Infections of Children"

Pediatriya, Akusherstvo i Ginekol (Pediatry, Obstetrics and Gynecology) 1973, No 4, pp 6-7 (From RZh - Biologicheskaya Khimiya, No 22, Nov 73, Abstract No 1705)

Translation: One hundred twenty six children were studied during acute respiratory illness (ARI). The studies carried out explained the changes in the concentration of immunoglobulins in blood serum, in relationship to age, type of the disease, and complications. Children up to 1 year of age ailing with grippe and ARI of unknown etiology exhibited a lower concentration of immunoglobulin G and an increased content of the immunoglobulin A. In the 1-3 year group of children sick with grippe and pneumonia a significantly increased content of immunoglobulin G was noted with lower concentration of the immunoglobulin A. The macroglobulins of these children exhibited a tendency to an enlargement, in case of children ailing with pneumonia this elevation was statistically significant. With otitis complications the concentration of immunoglobulin M increased steadily.

1/1

Immunology

USSR UDC 616.988.21-085.373-07:616.115-097.5-078.7

LISYANYY, N. I., Kiev Medical Institute

"Some Aspects of Interference in Passive-Active Immunization Against Rabies"

Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, No 12, 1971, pp 71-75

Abstract: The effect of antirabies gamma-globulin on different stages of the transmission of antigenic information and antibody synthesis was studied in mice that received peritoneal cells from donors previously inoculated with rabies vaccine. The experiments showed that when the antirabies gamma globulin was present at the time the antigen was seized by the peritoneal cells, the antibody titer increased in the recepients of the cells. However, when the gamma globulin was present at this and later stages, active antibody synthesis was inhibited. The effect of "passive" antibodies in the stage of "transmission of information from macrophages by lymphoid cells" was due to the action of the "passive" antibodies in the stage of immune globulin synthesis. The mechanism of inhibition of active antibody synthesis by "passive" antibodies is apparently determined both by the interaction of antigen and "passive" antibodies and by the fact that "passive" antibodies are capable of influencing the cells involved in the immune process in two ways: (i) by intensifying the immunogenic function of the macrophages and (ii) by

USSR

UDC 612.013.1.014.43.014.461

POKROVSKIY, V. I., BULYCHEV, V. V., LISYKOV, T. Ye., MALEYEV, V. V., UTEKHIN, V. A., CHERNAYEVA, T. Ye., MAYOROV, Yu. M., MILOVIDOVA, S. S., and KAFAROV, K. A., Central Department of Infectious Pathology, Scientific Research imeni N. N. Pirogova, Institute of Epidemiology, Ministry of Health USSR, and chair of Hospital Therapy, Evening Faculty, Second Moscow Medical Institute, and Chair of Hygiene, State Central Institute for Physical Culture

"Effect of Dehydration and Hyperthermia on Homeostasis in Healthy Persons"

Moscow, Sovetskaya Meditsina, No 2, 1973, pp 27-31

Abstract: Blood chemistry and cardiovascular changes were studied in 20 healthy males aged 18 to 32 before and after staying various lengths of time in a sauna bath (15 to 30 and 35 to 55 minutes of exposure to temperatures of 80 to 100° and humidity of 8%). In those who remained in the sauna 15 to 30 minutes, hyperthermia resulted in hyperfunction of the heart, slowing of the blood flow, elevation of the pH and pressure of venous blood, increase in serum proteins and in the specific gravity and viscosity of blood, decrease in clotting time, loss of chlorine and potassium. In the group that remained in the sauna over 35 minutes, dehydration caused a loss of electrolytes (chiefly chlorine and potassium) with urine, cardiac hypofunction, slowing of the blood

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USSR

POKROVSKIY, V. I., et al., Sovetskaya Meditsina, No 2, 1973, pp 27-31

flow, decrease in venous and arterial blood pressure, shortening of clotting time, and increase in blood proteins, specific gravity, viscosity, and pH. The biochemical changes in both groups were within physiological limits and had no lasting effects. These findings can be used to determine disruptions of homeostasis, evaluate alterations in water-salt metabolism, acid-base equilibrium, etc. in infectious patients, and assess the efficacy of therapy, particularly in gastrointestinal diseases.

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Phytology

UDC 557.37:581.1

USSR

VOLKOV, G. A., and LISYUK, L. A., Agrophysical Scientific Research Institute, Academy of Agricultural Sciences imeni V. I. Lenin, Leningrad

"Interpretation of the Bioelectrical Reaction of Plants to Stimulation Using the Effect of Light as an Example"

Moscow, Doklady Akademii Nauk SSSR, Vol 197, No 6, 21 Apr 71, pp 1,435-1,437

Abstract: Previous studies have shown that the resting, potential (r.p.) of a cell and the potential difference (p.d.) between illuminated parts of plant leaf and the nonilluminated part of the leaf are changed through a number of stages. A corresponding multiphase change is observed in the sudden transition from illumination to darkness. The changes in r.p. and p.d. were close in magnitude and duration. This and the specific bioelectrical response of either plant cell or leaves of the entire plant to the same stimulant led to the conclusion that there must be a fundamental mechanism involved in these phenomena. In this study, external and internal recording of electric potentials at Nitella plant cells suspended in standard solutions were determined. In another 18-day experiment two bean leaves were used and the effect of illumination on them was studied. It was found that the character of the

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VOLKOV, G. A., and LISYUK, L. A., Doklady Akademii Nauk SSSR, Vol 197, No 6, 21 Apr 71, pp 1,435-1,437

course of the reaction at the Nitella is largely identical for both reactions. It was concluded that the processes involved in the adsorption of light by chloroplasts of illuminated photosynthesizing cells of the plant leaf affect the characteristics of the external cytoplasm membrane of these cells. Otherwise the change in the p.d. recorded at the plant leaf reflects the change in the potential difference at the plasmalemma of the cells of the palisade parenchyma on the illuminated part of the leaf. It was concluded that any factors, among them temperature and chemical compounds, which can affect the properties of the plasmalemma of corresponding cells in any part of the plant (leaf, root, stem) must bring about changes in the r.p. of the part of the plant which is removed from this part.

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USSR UDC 576.851.214 (Enterococcus).06

SHUSTER, B. YU., LIKHODED, V. G., SERGEYEV, V. V., YELKINA, S. I., and LITAREV, V. A., Moscow Institute of Vaccines and Sera imeni Mechnikov

"Transduction Analysis of the Virulence of Revertants of S. enteritidis Streptomycin-Dependent Mutants"

Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, No 12, 1971, pp 58-62

Abstract: Using the transduction method with phage P 22, the authors found that the virulence of avirulence of revertants of S. enteritidis No 921 str-d mutants varied with the nature of the reverse mutation. Virulence was restored in the true revertants while the suppressor revertants remained avirulent. In transduction of markers from the virulent str-r strain to the suppressor avirulent revertants, the str-r transductants exhibited segregation with respect to virulence. The virulence of the transductants was due to substitution of the su-str$^-$ gene suppressor for the su-str$^+$ gene suppressor. It would appear, therefore, that mutation in the su-str gene suppressor results in the loss of virulence.

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UDC 531.717.55

USSR

GAMAYUNOV, G.K., and [redacted]

"Measuring Needle for Ferrite Sorting Automata"

USSR Authors' Certificate No 301517, Cl. G 01 b 7/24, filed 3 Dec 69, published 8 Jun 71 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 1, Jan 72, Abstract No 1A482P)

Translation: The proposed measuring needle for ferrite sorting automata contains current-conducting elements, between which there is an insulation spacer. To increase operating reliability, the spacer takes the form of a biconcave element of vitroceramic enamel. 1 illustration.

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USSR

LITINETSKIY, I., Candidate of Technical Sciences

"Bionics: In the Warehouse of Nature's Patents"

Moscow, Krasnaya Zvezda, 9 Jul 72, p 4

Abstract: Bionics uses the accumulated knowledge of other sciences to construct machines, technological processes, etc., using living organisms as models. The basic principles by which complex living organisms function are used to design man-made systems which function according to similar principles. Olfactory, aural, and optic models have already been constructed; a model of the human nervous system is being developed. Morphological study of living organisms has produced vehicles able to function in special terrains and working models of the human hand. Bacteriological sources of electrical energy, useful in space applications where size and weight are important, have already been found, and photosynthetic sources are being developed.

USSR UDC 539.192/.194+535.33/.34.01

BOLOTIN, A. B., LYASH, A. V., LITINSKIY, A. O.

"Electron Structure of Aluminum Hydride"

Lit. fiz. sb. (Lithuanian Physics Collection), 1972, Vol. 12, No. 2, pp 253-257 (from RZh-Fizika, No 10, Oct 72, Abstract No 10D118)

Translation: The AlH_3 molecule was investigated within the framework of the expanded Wolfsberg-Helmholtz method for two possible structures: plane and pyramidal. The Slater wave functions were used as base functions for the Al and H atoms. Self-consistent MO, single-electron energy levels, the population of orbitals, and charges on the atoms were obtained from solving the Wolfsberg-Helmholtz equations. The dipole moment was calculated. A comparison is made with the theoretical results obtained for this molecule by other authors. 10 ref. Authors abstract.

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USSR

LITINSKIY, YE. G.

"The Structure of Invariant Measures Related to Noncommutative Random Products"

Mat. Sb. [Mathematics Collections], 1973, 91, No 1, pp 88-108 (Translated from Referativnyy Zhurnal Kibernetika, No 9, 1973, Abstract No 9V21)

Translation: Suppose G = SL(R,n) is a group of mappings of the real projective space P^{n-1} in itself. The concept of the boundary measure ν in P^{n-1} is introduced for probability measure μ in G and its relationship to the uniqueness of the invariant measure in P^{n-1} relative to operator $\pi(x,A) = \mu\{g \in G: gx \in A\}$ is explained. It is established that the Markov chain generated by the transient probability $\pi(x,A)$ and the boundary invariant measure ν is a factor automorphism of the automorphism of a certain Bernoulli space. One limit theorem is proven for random mappings of a straight line sector in itself.

Author's view

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USSR UDC 669.1.017.3:669.14.018.44:621.771.016.2

YUFEROV, V. M., and LITINSKIY, YU. D., All-Union Scientific Research Pipe Institute (Dnepropetrovsk)

"Phase Transformations in Martensite-Ferrite Steels in the Process of Hot Torsion Deformation"

Kiev, Metallofizika, No 39, 1972, pp 80-84

Abstract: The effect of hot torsion deformation on the structural and phase transformations in heat-resistant martensite-ferrite steels, taking place directly in the deformation site, was studied. Hot torsion of 8-mm-diameter samples was accomplished at 750-1275°C every 25 and 50° with subsequent prompt quenching. It was established that plastic deformation by torsion facilitates the alpha-gamma transformation, which leads to a decreased amount of ferrite and increased quantity of austenite in the steel in comparison with the equilibrium state at atmospheric pressure. The intensity of this effect is diminished with increased twisting temperature. It was shown that two-phase steels are found in the metastable state in the process of hot torsion as a result of phase transformations taking place, the realization of which is determined by the magnitude of shear and tangential stresses and no increased pressures in the deformation site. 1 table, 2 figures, 16 bibliographic references.

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1/2 022 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--EVALUATION OF THE STRUCTURE OF TWO PHASE STEELS BY A PHOTOEFFECT METHOD -U-

AUTHOR--LITINSKIY, YU.D.

COUNTRY OF INFO--USSR

SOURCE--ZAVOD. LAB. 1970, 36(2), 207-8

DATE PUBLISHED--------70

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TOPIC TAGS--MARTENSITIC STEEL, METAL ETCHING, PHOTO EFFECT, PHOTOELECTRIC EFFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1993/0234 STEP NO--UR/0032/70/036/002/0207/0208

CIRC ACCESSION NO--AP0113214

UNCLASSIFIED

2/2 022 UNCLASSIFIED PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0113214

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A DEVICE IS DESCRIBED FOR A QUANT. DETN. OF FREE FERRITE IN THE STRUCTURE OF THE FERRITIC MARTENSITIC STEELS BY USING THE PHOTOELECTRIC EFFECT. THE FERRITE AREAS ARE ONLY LIGHTLY ETCHED IN CONTRAST TO MARTENSITE, SO THAT THE INTENSITY OF THE REFLECTED LIGHT IS DEPENDENT ON THE IR RELATIVE AMTS. THIS INTENSITY IS RECORDED BY AN PHOTOELEC. TRANSDUCER. TO OBTAIN RELIABLE RESULTS, ELECTROLYTIC ETCHING IS RECOMMENDED. FACILITY: VSES, NAUCH.-ISSLED. KONSTR.-TEKHNOL. INST. TRUB. PROM., DNEPROPETROVSK, USSR.

UNCLASSIFIED

UDC 616.34-022-078:576.8.083.33

USSR

YURKO, L. P., LITINSKIY, YU. I., and PUCHKOVA, A. V., Department of Infection Pathology, Central Scientific Research Institute of Epidemiology and Second Clinical Hospital for Infectious Diseases, Moscow

"Use of Modern Liquid Enrichment Media to Diagnose Intestinal Infections"

Moscow, Laboratornoye Delo, No 9, 1971, pp 544-547

Abstract: A comparison was made of the value of selenite broth and medium M (magnesium) in diagnosing acute intestinal infections. Medium M was prepared by mixing together three solutions: (i) peptone, NaCl, Kh_2PO_4, yeast dialysate, and distilled water; (ii) $MgCl_2$ and distilled water; (iii) 0.15% aqueous solution of brilliant green. A total of 1,263 coprological analyses were made of stools obtained from adults hospitalized with diagnoses of food poisoning, acute dysentery, gastroenterocolitis, etc. Positive identifications were made in 107 cases. Shigella strains were identified in 10 cases (9 S. sonnei strains and 1 S. flexneri strain) while Salmonellas belonging to 13 serotypes of groups B, C, D, and E were identified in 97 cases. Most of the Salmonellas identified were from group C. The two media were of equal value except that three more cultures were isolated from the M medium than

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USSR

YURKO, L. P., et al., Laboratornoye Delo, No 9, 1971, pp 544-547

from the selenite broth. The M medium is particularly recommended for diagnostic purposes because it is convenient, cheap, and can be stored.

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USSR UDC: 621.382.3:621.372.061

PARATOV, G. M., LITKENS, Ye. M., and SHUL'GINA, G. S.

"Using the Electronic Computer to Model the Relation Between Qualitative Indices and Structural Parameters of a Transistor"

Kiev, Izvestiya VUZov SSSR--Radioelektronika, No. 6, 1970, pp 701-709

Abstract: This article considers the application of a mathematical model on an electronic computer for analyzing a planar diffusion transistor typically used as the active component in an integrated circuit. The computation of the qualitative indices of such a transistor as a function of its structural parameters, the impurity distribution in its structure, and the physical characteristics of the semiconductor, uses the description of the migration process and the recombination of carriers, as well as many other factors; consequently, a general algorithm for computing its static and dynamic qualitative indices is extremely difficult and must be worked out on an electronic computer. The model worked out by the author is given in the form of a block diagram. The mathematical model of the transistor contains the electrical qualitative indices of the device which are used as output parameters while the structural and physical indices of the integrated circuit are used as input parameters. The programs of the mathematical model were made up of the "Engineer" autocode input language, and the calculations were done on the Minsk-22 computer.

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Byelorussian SSR

UDC 620.21

TsAREV, G. L. and LITMANOVICh, I. S.

"A Study of Some Possibilities of Obtaining Dispersion Reinforced Aluminum Composition Alloys"

Minsk, Vestsi Akademii Navuk BSSR, No 2, 1973, pp 29 - 34

Abstract: Considerable hardening can be achieved by dispersing particles of refractory oxides in a metal matrix. Although this is usually done by powder metallurgical methods, the use of foundry methods has been demonstrated.

The authors formed a saturated metallic solution of dispersion particles in two ways, by blowing oxidizing agents through a solution of aluminum to form refractory aluminum oxide particles and by condensing oxide vapors in a solution. Three vapors were chosen for the experiment, Rhenium oxide and molybdenum oxide, because their low heats of formation and relatively low heats of vaporization were convenient and conducive to an aluminothermic reaction, and carbon dioxide because of the great practical value of any successful results with it.

Results of 3 - 5 minute treatments showed increases in hardness averaging 15 - 20%, sometimes as high as 50 - 60%. Thirty-minute heat treatments at temperatures up to 400 degrees centigrade did not eliminate the gains. The treated samples

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TsAREV, G. L., et al., Minsk, Vestsi Akademii Navuk BSSR, No 2, 1973, pp 29 - 34

also lost less hardness in preliminary cold working. At a temperature of 200 degrees centigrade, the hardness of an aluminum sample treated with Rhenium oxide exceeded that of pure aluminum by 70%. Tests were also made of the effect of vapor pressure, blow-through time and solution temperature; because of the greater convenience of regulation, these tests were made with carbon dioxide. All three factors were shown to have a significant effect.

An attempt was made to reduce slag formation by applying ultrasonic vibrations to the melt, but this had the side effect of speeding the reaction and leading to the formation of larger particles, thus negating the advantages gained.

The second experiment, vapor condensation, was done with boron oxide. Well dispersed, fairly uniform particles of boron oxide were inserted into aluminum and aluminum with 5% copper, but the hardness was increased by only about 5 - 8%, probably due to the low hardness of the boron oxide particles.

The proposed processes are thus shown to be useful and subject to control by varying the three factors mentioned.
2/2

USSR

UDC 620.1

TSAREV, G. L., and LITMANOVICH, I. S., Physicotechnical Institute, Academy of Sciences Belorussian SSR

"Investigation of Some Possibilities of Producing Precipitation-Hardened Aluminum Alloy Composites"

Minsk, Izvestiya Akademii Nauk BSSR. Seriya Fiziko-Tekhnicheskikh Nauk, No 2, 1973, pp 29-34

Abstract: The possibility of producing precipitation-hardened aluminum alloy composites was investigated in which saturation of the metallic melt with dispersed inclusions was conducted in two variants: 1) formation of dispersed refractory particles of aluminum oxide as a result of blowing oxide vapors of elements, capable of aluminothermal reaction, through the aluminum melt; and 2) formation of dispersed particles as a result of oxide vapor condensation from passage through the melt. Rhenium oxide (Re_2O_7), Molybdenum oxide (MoO_3), and carbon dioxide were selected as the materials to be passed through the melt in the vaporous state. Hardness tests of the hardened samples showed that the Brinell hardness at 20°C was 12.65 for pure aluminum, 14.0 for Al + Re_2O_7, 14.9 for Al + CO_2, and 19.1 for Al + MoO_2. At 300°C these values were 1.6, 1.95, 2.65, and 2.90, respectively. It was established that the nature of the process, dispersity of particles, uniformity of inclusion distribution, and magnitude

USSR

TSAREV, G. L., et al, Minsk, Izvestiya Akademii Nauk BSSR. Seriya Fiziko-Tekhnicheskikh Nauk, No 2, 1973, pp 29-34

of achieved strength are strongly affected by melt temperature, reaction rate, and time and pressure of the blow of oxide vapors through the melt. From this aspect there is a strong possibility that this process can be controlled, thus making it an additional method of producing cast metallic composites. 3 figures, 1 table, 7 bibliographic references.

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USSR UDC: 621.396.69:621.319.4

KRAVCHINSKAYA, Ye. B., LITMANOVICH, L. Kh.

"Metallized Polyfluoroethylene Capacitors"

Elektron. tekhnika, Nauchno-tekhn. sb. Radiodetali (Electronic Technology. Scientific and Technical Collection. Radio Components), 1970, vyp. 2 (19), pp 19-30 (from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1V287)

Translation: The authors discuss peculiarities in the design and technique of manufacturing metallized polyfluoroethylene capacitors. Electrical characteristics are presented for the K72-9 capacitor series which has been developed. The advantages of metallized polyfluoroethylene capacitors over foil capacitors are pointed out.

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LITNINOVA, Yu. A.

Industrial Hygiene

So: JPRS 55015
23 Jan 73

UDC: 614.1:313.13]:677.463.021.5

MORBIDITY INVOLVING TEMPORARY DISABILITY AMONG YOUNG WOMEN SPINNERS IN THE VISCOSE INDUSTRY

(Article by I.S. Kramarenko, I.N. Yakovleva, Yu.A. Litvinova, F.I. Grishko; Kiev Scientific Research Institute of Industrial Hygiene and Occupational Diseases; Moscow, Sovetskoye Zdravookhraneniye, Russian, No 12, 1972, submitted 14 June 1971, pp 59-62)

The exposure for the chemical industry is annually augmented with qualified workers largely referable to young people ranging in age from 18 to 20 years who have completed a vocational technical school. At this age, as shown by our studies, as well as those of V.A. Doskin, Yu.D. Kalashnikov, and others, there may be increased sensitivity to a number of chemicals encountered in modern industry.

In the spinning mills of the viscose industry, where young men and women, starting at the age of 18 years, learn the trade and work, it is observed that diverse industrial factors exert a combined influence. Among them the predominant role belongs to carbon disulfide, a toxic substance that affects the organism even in relatively low concentrations. One of the early manifestations is a rise in level of nonspecific disease (S.E. Sar'yan and V.M. Shubik; V.M. Rashin; N.V. Petrov, and others).

Our observation included investigation of morbidity involving temporary disability among young workers during the first few years of contact with the industrial environment, determination of long term results of such contact, and of the correlation between the indices studied and working conditions. For this purpose a comparative analysis was made of morbidity involving temporary disability among young girls studying to be spinners in the viscose industry, who until 2 years going through apprenticeship in other than chemical enterprises and the same age, training period, living conditions, as well as young spinners during their first years on the job in the viscose industry under divers working conditions (term worked in mills where the carbon disulfide concentration in the buildings ranged from 10-30 mg/cubic meter, and others where the concentration of the same substance did not exceed 10 mg/cubic meter). Finally, a study was made of the morbidity rate among spinners in the viscose industry of different ages, i.e. at the age of 18-20 and 21-30 years, and in each of these groups, tenure constituted 10-15 years at the time

USSR

UDC 632.95

BABIN, Ye. P., SKAVINSKIY, Ya. P., ANDRUKHOV, N. A., SEDLOVA, L. N., LITOSHENKO, N. A., and RUDAVSKIY, V. P.

"Chlorination of Diphenyl Ether and Its Derivatives"

Khim. tekhnologiya. Nauch.-proizv. sb. (Chemical Technology. Science-Production Collection), No 3 (69), 1973, pp 48-49 (from RZh-Khimiya, No 22, 25 Nov 73, Abstract No 22N571 by D. Z. Levin)

Translation: Sulfides of metals with variable valence or mixtures of Sb_2S_5 and I_2 are used as a catalyst to chlorinate Ph_2O and $(MeC_6H_4)_2O$. Example. Ph_2O and 0.3% Sb_2S_5 are loaded into a reactor and Cl_2 is supplied at 70-80° for 4 hours at the rate of 30 g/hour. Tetrachlorodiphenyloxyide is obtained, boiling point 155-7°/5. Heptachlorodiphenyloxide, FeS, 111-3 are obtained in a similar fashion (the substance, catalyst, and boiling point in °C are given); octachloro-4, 4'-ditolyl ether, FeS, 192-4 (ethyl alcohol); ω,ω,ω,ω',ω',ω'-hexachloro-ditolyloxide, PCl_5, —; ω,ω,ω,ω',ω',ω'-hexachloro-2,2'-dichloroditolyl ether, Sb_2S_5, 300 (decomposition); trichloro-4,4'-dicarboxydiphenyloxide, —, 259-61; pentachloro-4,4'-dicarboxydiphenyloxide, $I_2 + H_2SO_4$, 192-3; octachloro-4, 4'-dicarboxydiphenyloxide, $H_2SO_3 + I_2$, 268-70. These chloro derivatives are used as synergistic additives in herbicides, insecticides, and nematocides.

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USSR

UDC 632.95

RUDAVSKIY, V. P. and LITOSHENKO, N. A.

"Tetrachloro Anhydride Derivatives of bis-Acylamidophosphates"

Khim. tekhnologiya. Nauch.-proizv. sb. (Chemical Technology. Science-Production Collection), No 3(69), 1973, pp 55-56 (from RZh-Khimiya, No 22, 25 Nov 73, Abstract No 22N508 by S. Ye. Lyubarskaya)

Translation: A description is given of the reaction of the tetrachloro anhydride of terephthaloil-bis-amidophosphate (I) with alcohols, phenols (II), oximes (III), amines (IV), and Na salts of carboxylic acid and formation of the corresponding derivatives with the general formula $[C(O)NHP(O)(R)R']_2$ (VI), where R and R' = the alkoxyl, phenoxy-, or acyloxy group, substituted amino group and oxime radical. The reactions with II, III, and IV are carried out in a C_6H_6 solution in the presence of Et_3N at 20° or boiling and the reactions with V are carried out in acetone. Depending on the stoichiometric ratios of the reagents used, 2 or 4 Cl atoms are substituted in the tetrachloro anhydride. Example. I in C_6H_6 is added to a solution of PhOH and Et_3N, boiled for 40 min, kept 4 hours at 20°, $Et_3 \cdot HCl$ filtered out, and the solvent distilled off to obtain as a residue VIa (R = R' = PhO, boiling point 163-5°. VI are presented (R = R' and melting point in °C are given): for VIa: AcO, 178-80; $PhCH_2NH$,

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RUDAVSKIY, V. P. AND LITOSHENKO, N. A., Khim. tekhnologiya. Nauch.-proizv. sb., No 3(69), 1973, pp 55-56

241-3; for VIb : PrO, 125-7; PhO, 173-5; 4-BrC_6H_4NH, 238-40. The dichlorodicyclohexanoxime and tetracyclohexanoxime esters of VIb were also obtained, melting point 203-4 and 191-2°, respectively. VIa (R = R' = OH) obtained by hydrolysis of I in acetone at 20° for 20 hours, melting point 218-9°.

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USSR

RUDAVSKIY, V. P., LITOSHENKO, N. A., and BABIN, YE. P.

"Synthetic Method for Tetra-(p-nitrophenyl)-ester of Dichloromaloylbisamidophosphoric Acid"

USSR Author's Certificate No 345164, filed 2 Aug 68, published 6 Mar 73 (from RZh-Khimiya, No 20, Oct 73, Abstract No 20 N 507P)

Translation: Tetra-(p-nitrophenyl)-ester (I) of dichloromaloylbisamidophosphoric acid is obtained by reacting $CCl_2[CONHP(O)Cl_2]_2$ (II) with $p\text{-}NO_2C_6H_4CH$ (III) in presence of an HCl acid acceptor, in an inert organic solvent. Example. A mixture of 0.04 mole III, 0.04 mole Et_3N, 0.04 mole II in 20 ml C_6H_6 is refluxed for 30-40 min and kept for 6 hr at 20°, the $Et_3N \cdot HCl$ is filtered off, the solvnet evaporated, yielding I, the yield 62%, m.p. 107-8°. I exhibits a high fungicidal and insecticidal activity.

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USSR UDC 547.461'3.26.118.07

RUDAVSKIY, V. P., LITOSHENKO, N. A., and BABIN, YE. P.

"A Method of Making Tetra-(p-nitrophenyl) Ester of Dichloromaloylbis-Amidophosphoric Acid"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 22, Aug 72, Author's Certificate No 345164, Div C, filed 2 Aug 68, published 14 Jul 72, p 96

Translation: This Author's Certificate introduces a method of making tetra-(p-nitrophenyl) ester of dichloromaloyl-bis-amidophosphoric acid. As a distinguishing feature of the patent, dichloromaloyl-bis-amidophosphoryl tetrachloride is reacted with p-nitrophenol in the presence of a hydrogen chloride acceptor in an inert organic solvent with subsequent isolation of the goal product by conventional methods.

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UDC 547.58:546/547.07

RUDAVSKIY, V. P., and LITOSHENKO, N. A.

"Bis-haloacylamidoarylphosphonic Acid Dichlorides"

Kiev, Khimicheskaya Tekhnologiya, No 2 (62), Mar-Apr 72, pp 62-63

Abstract: Bis-haloacylamidoarylphosphonic acid dichlorides are formed in the reaction of bis-phenyldichlorophosphazohalocarbacyls with water, or anhydrous formic or acetic acids. They are crystalline materials, readily soluble in benzene, acetone, and dioxane. They react vigorously with alcohols, phenols, amides, and other compounds with an active hydrogen or metal atom.

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UDC 632.95

USSR

RUDAVSKIY, V. P., and LITOSHENKO, N. A.

"Tetraanilides of bis-Polyhaloacylamidophosphoric Acids"

Khim. Tekhnologiya. Nauch.-Proizv. sb. [Chemical Technology, Scientific and Production Collection], No 6(60), p 45, 1971, (Translated from Referativnyy Zhurnal, Khimiya, No 9, 1972, Abstract No 9 N484 by T. A. Belyayeva)

Translation: bis-Polyhaloacylamidophosphoric acid tetraanilides were produced in order to study their physiological properties (I; II acid) by the reaction of II acyl tetrahalides (III) with amines (An) in the presence of Et_3N or with double the quantity of An. 1. 0.01 mol III in 20 ml C_6H_6 was added to a solution of 0.08 mol An in 30 ml C_6H_6, cooling with ice water, kept for 6 hours at ~20°, filtered, evaporated, the residue crystallized, washed with water and alcohol, dried, producing I, yield 67083%. 2. 0.01 mol III in 20 ml C_6H_6 was added to a solution of 0.04 mol An, 0.04 mol Et_3N in 30 ml C_6H_6, cooling with ice water, boiled for 30-40 minutes, kept for 30 hours at 20°, filtered, evaporated, yielding I, yield 70-80%. 3. 0.01 mol bis-trichlorophosphazohaloacyl in 20 ml dioxane was added to a solution of 0.12 mol An in 30 ml dioxane with cooling with ice water, kept for 8 hours at 20°, 50 ml of 96% alcohol was added, boiled 30 minutes, yielding I.

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USSR

UDC 547.46.185:542.91

RUDAVSKIY, V. P., and LITOSHENKO, N. A.

"Tetraanilides of bis-Polyhaloacylamidophosphoric Acid"

Kiev, Khimicheskayay Tekhnologiya, No 6 (60), Nov-Dec 71, p 45

Abstract: To a solution of 0.08 g-mole of amine in 30 ml benzene 0.01 g-mole of bis-polyhaloacylamidophosphoric acid tetrachloride (I) in 20 ml benzene is added with stirring and cooling, the mixture is then left standing for 6 hrs at room temperature, the precipitated amine hydrochloride is filtered off, the solvent removed, and the residue recrystallized to yield the desired tetraanilide. Another method consisted of adding (I) to a mixture of amine and triethylamine in benzene, refluxing for 30-40 min and letting the mixture stand for about 30 hrs at room temperature. The workup remained unchanged. Instead of benzene, dioxane may be used as a solvent. After the addition of the reagents is completed, alcohol is added and the mixture refluxed; the product then precipitates out.

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USSR UDC 632.95

RUDAVSKIY, V. P., KUCHEROVA, M. N., KONDRATENKO, V. I., LITOSHENKO, N. A., and BABIN, Ye. P.

"Synthesis of Acylphosphazo Compounds"

USSR Author's Certificate No 316694, filed 10 Jun 68, published 27 Jan 72 (from Referativnyy Zhurnal -- Khimiya, Svodnyy Tom (I, L-S), No 1(II), 1973, Abstract No 1N505P by T. A. Belyayeva)

Translation: Compounds RC(X)N = P(OOCR')YZ (I) (R = alkyl, alkyl halide, phenyl halide; X = O, NPh, NEt, NC_6H_4Me; R' = alkyl, alkyl halide, phenyl halide; Y and Z = Cl or OOCR') and $(R'''COO)_3P$ = NOCR''CON = $P(OOCR''')_3$ (II) (R'' = alkylene halide; R''' = alkyl, alkyl halide, phenyl halide) are synthesized in reaction of corresponding trichloro- and bistrichlorophosphazo compounds (III) with carbonate in organic solvent. The reaction is terminated by boiling of the reaction mixture. Example. To 0.03, 0.06, or 0.09 mole R'COOM (M = Na or K) in 30 ml of organic solvent 0.03 mole RCON = PCl_3 is added during continuous stirring and cooling with ice water. The reaction mixture is boiled for 8-10 hrs on water bath, kept at 20°C for 6 hrs, MCl is removed by filtration and the remained mass is concentrated by evaporation. The obtained viscous liquid (I) (X = O) is purified by multiple precipitation from C_6H_6 or PhMe with petroleum ether. Using III, compounds II are prepared in a similar way. I and II can be used as herbicides.

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UDC 547.464:632.954

USSR

RUDAVSKIY, V. F., LITOSHENKO, N. A., and ZAGNIBEDA, D. M.

"Some Derivatives of Trichloro- and bis-Trichlorophosphazohalocarbacyls"

Kiev, Khimicheskaya Tekhnologiya, No 1(55), Jan-Feb 71, pp 19-23.

Abstract: Searching for novel herbicides, fungicides, and insecticides, a series of phosphorylated derivatives of halocarboxylic and halodicarboxylic acids was prepared. Reacting trichloro- and bis-trichlorophosphazocarbacyls when phenols, thiophenols, furfuraloximes, and acetophenoxime in the presence of triethylamine, or with sodium phenoxide, thiophenoxide or acetate gave a series of products of different degree of substitution depending on the ratio of the reagents taken. Reaction of trichlorophosphazohalocarbacyls with amines gave trianilidophosphazohalocarbacyls. Reactions of one, two, or three moles of phenol or thiophenol with trichlorophosphazohalocarbacyls gave monothiophenoxydichloro-, dithiophenoxychloro-, and triphenoxy(trithiophenoxy)phosphazohalocarbacyls respectively. Bis-trichlorophosphazohalocarbacyls react with phenols and thiophenols yielding bis-monophenoxy(thiophenoxy)-, dichloro-bis-diphenoxy(dithiophenoxy)chloro-, and bis-triphenoxy(trithiophenoxy)phosphazohalocarbacyls. Oximes in presence of triethylamines

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RUDAVSKIY, V. P., et al., Khimicheskaya Tekhnologiya, No 1(55), Jan-Feb 71, pp 19-23

or sodium acetates, when allowed to react with bis-trichlorophosphazohalocarbacyls, form di-, tetra-, and hexasubstituted bis-trichlorophosphazocarbacyls.

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UDC 632.95

USSR

RUDAVSKIY, V. P., LITOSHENKO, N. A., BABIN, YE. P.

"Bis-Trichlorophosphazopolyhalogen Carbacyls"

Khim. prom-st' Ukrainy. Nauchno-proizv. sb. (Chemical Industry of the Ukraine -- Collection of Scientific and Production Works), 1970, No 2(50), pp 46-47 (from RZh-Khimiya, No 19 (II), 10 Oct 70, Abstract No 19 N565 by S. LYUBARSKAYA)

Translation: Biologically active compounds of the formula $R(CON=PCl_3)_2$ (I) are obtained by the reaction of diamides of polyhalogen carboxylic acids with two moles of pulverized PCl_5 in a medium of PhCl or $PhNO_2$ at 80-120°/300-400 mm for 50-80 minutes or by passing dry Cl_2 through a mixture of diamide with two moles PCl_3 in CCl_4 under the same conditions. A vacuum is needed to remove the HCl gas which produces the various I. The following I are obtained with a yield of 86-96 percent (shown are R, melting point and decomposition temperature in °C): CCl_2, 118-21, 130-40; $(CH_2)_2$-$(CCl_2)_2$, 117-9, 140-50; $(CH_2)_4(CCl_2)_2$, 119-21, 160-70; $(CH_2)_6$-$(CCl_2)_2$, 159-61, 170-80; $(CF_2)_3$, 44-6, 200-210; $(CF_2)_4$, 76-8, 230-40; $p\text{-}CF_2(C_6H_4)_2$, 82-5, --; $(p\text{-}CF_2\text{-}C_6H_4)_2$, 127-9. The rate of

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RUDAVSKIY, V. P., et al, Khim. prom-st' Ukrainy. Nauchno-proizv. sb. 1970, No 2(50), pp 46-47 (from RZh-Khimiya, No 19 (II), 10 Oct 70, Abstract No 19 N565 by S. LYUBARSKAYA)

the diamide reactions with PCl_5 decreases with an increase in the number of electronegative substituents in the bisacyl groups, but the thermostability of I increases.

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1/2 023 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--BIS,TRICHLOROPHOSPHAZO,POLYHALOCARBACYLS -U-

AUTHOR-(03)-RUDAVSKIY, V.P., LITOSHENKO, N.A., BABIN, YE.P.

COUNTRY OF INFO--USSR

SOURCE--KHIM. PROM. UKR. 1970, (2), 46-7

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CHLORINATED ORGANIC COMPOUND, AZO COMPOUND, ORGANIC PHOSPHORUS COMPOUND, ELECTRONEGATIVITY, CHEMICAL SUBSTITUENT, ACYL RADICAL, THERMAL STABILITY, ORGANIC SYNTHESIS, THERMAL DECOMPOSITION, CHEMICAL REACTION TEMPERATURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/0823 STEP NO--UR/0436/70/000/002/0046/0047

CIRC ACCESSION NO--AP0124490
UNCLASSIFIED

2/2 023 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124490

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE COMPDS. (I), OF GENERAL FORMULA R(CON:OCL SUB3) SUB2, ARE PREPD. BY REFLUXING A POLYHALOCARBOXYLIC ACID DIAMIDE (II) IN VACUO WITH TWICE ITS WT. PCL SUB5 AT 80-120DEGREES. BY INCREASING THE NO. OF ELECTRONEG. SUBSTITUENTS IN THE ACYL GROUPS OF II, THE RATE OF REACTION WITH PCL SUB5 AND THE THERMAL STABILITY OF THE I PRODUCED CAN BE GREATLY INCREASED. I PREPD. ARE (R, REACTION TEMP., REACTION TIME (MIN), PERCENT YIELD, M.P., AND THERMAL DECOMPN. TEMP. GIVEN): (FORMULA SHOWN ON MICROFICHE).

UNCLASSIFIED

USSR UDC 547.464.7

RUDAVSKIY, V. P., LITOSHENKO, N. A., and KUKHAR', V. P., Institute of Organic Chemistry, Academy of Sciences Ukrainian SSR

"Phosphorylated Derivatives of Polychlorodicarboxylic Acid Diamides"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 5, May 70, pp 1002-1005

Abstract: Polychlorodicarboxylic acid diamides react with phosphorus pentachloride to give bistrichlorophosphazopolychloracyls (I). The latter react with primary amines, phenols and thiophenols to give bistriamidophosphazopolychloracyls (II) and bistriaroxy- and bistrithioaroxyphosphazopolychloracyls (III). Bisphosphazo compounds I-III are readily hydrolyzed with water or atmospheric moisture to corresponding bisacylamidophosphoric acid derivatives (IV). Tetraamides, tetraesters and tetrathioesters of polychlorobisacylamidophosphoric acids are obtained from polychlorobisacylamidophosphoric acid tetrachlorides (IV, X=Cl) and amines, phenols and thiophenols in the presence of triethylamine.

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Organophosphorus Compounds

USSR

UDC 547.46.632.954

RUDAVSKIY, V. P., LITOSHENKO, N. A., and BABIN, YE. P.

"Bis-trichlorophosphazopolyhalocarbazyls"

Kiev, Khimicheskaya Promyshlennost' Ukrainy, No 2, 70, pp 46-47

Abstract: Use was made of the synthesis of bis-trichlorophosphazopolyhalocarbazyls in order to establish the relationship between the structure and reactivity of polyhalodicarboxylic acid diamides and phosphorus pentachloride and to study the physiological properties as a function of the structure of polyhaloorganophosphorus compounds using the scheme of the phosphazo reaction. The reaction of polyhalodicarboxylic acid diamides with phosphorus pentachloride revealed the following regularity: when the number of electronegative substituents in the bis-acyl groups of polyhalodicarboxylic acid diamides is increased, the reaction rate with phospuorus pentachloride decreases. Bis-trichlorophosphazopolyhalocarbazyls are of great practical significance for obtaining various organophosphorus derivatives and biologically active compounds. These carbazyls are prepared from polyhalodicarboxylic acid diamides

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RUDAVSKIY, V. P., et al, Kiev, Khimicheskaya Promyshlennost' Ukrainy, No 2, 70, pp 46-47

which are placed into a reflux condenser together with double quantities of both phosphorus trichloride and carbon tetrachloride. At a vacuum of 200--300 ml and at 80--120°C, chlorine gas is passed through for 50--80 mins. Dicarboxylic acid dinitriles are prepared by thermal decomposition of bis-trichlorophosphazohalocarbazyls or by treatment with hydrogen chloride. Dicarboxylic acid dinitriles and phosphorus oxychlorides are identified by conventional methods.

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1/2 007 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--SOLUBILITY OF ALPHA NAPHTHOL, SEVIN, AND CO RAL IN VARIOUS SOLVENTS

-U-

AUTHOR-(02)-VERSHINIA, N.D., LITOVCHENKO, G.D.

COUNTRY OF INFO--USSR

SOURCE--ZH. FIZ. KHIM. 1970, 44(1) 255-6

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--SOLUBILITY, ORGANIC SOLVENT, HETEROCYCLIC OXYGEN COMPOUND, NAPHTHOL, CHLORINATED ORGANIC COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1989/0470 STEP NO--UR/0076/70/044/001/0255/0256

CIRC ACCESSION NO--AP0107076

UNCLASSIFIED

2/2 007 UNCLASSIFIED PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0107076

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SOLY. DATA ARE TABULATED FOR SLPHA NAPHTHOL IN CCL SUB4, CHCL SUB3, AND (CHCL SUB2) SUB2, OF SEVIN (1 NAPHTHYL METHYLCARBAMATE) IN CCL SUB4, CHCL SUB3, (CHCL SUB2) SUB2, BENZENE, TOLUENE, AND MEOH; AND OF 7 CO RAL (I) IN HE SUB2 CO, ETOH, AND ETOAC AT 0-70DEGREES, 0-80DEGREES, AND 0-50DEGREES, RESP.

UNCLASSIFIED

1/2 026 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--QUANTITATIVE DETERMINATION OF CHLOROTHIOPHOSPHATE CONTENT BASED ON INFRARED ABSORPTION SPECTRA --U-

AUTHOR-(02)-STEPANOVA, A.A., LITOVCHENKO, G.D.

COUNTRY OF INFO--USSR

SOURCE--ZAVOD. LAB. 1970, 36(2), 177-8

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CHLORINATED ORGANIC COMPOUND, ORGANIC PHOSPHORUS COMPOUND, IR SPECTRUM, CHEMICAL ANALYSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605002/E07 STEP NO--UR/0032/70/036/002/0177/0179

CIRC ACCESSION NO--AP0139478

UNCLASSIFIED

2/2 026 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0139478

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SYNTHESIS OF THE PESTICIDE CO-RAL (O,O,DI,ET O,(3,CHLORO,4,METHYL,2,OXO,2H,1,BENZOPYRAN,7,YL) PHOSPHOROTHIOATE) CAN BE FOLLOWED BY THE IR DETN. OF PSCL SUB3, ETOP(S)CL SUB2 AND (ETO) SUB2 P(S)CL. THE ABSORBANCE MAX. OF THESE 3 COMPDS., AT 752, 700, AND 658 CM PRIME NEGATIVE1, RESP., ARE EVALUATED ADN THE ABSORPTIVITIES OF THE INDIVIDUAL COMPDS. AND OF MIXTS. CONTG. 0-20PERCENT PSCL SUB3, 0-20PERCENT ETOPSCL SUB2, AND 50-100PERCENT (ETO) SUB2 PSCL ARE TABULATED. THE MAX. ABS. ERROR IS 5PERCENT.

FACILITY: SHCHELKOV, FILIAL, VSES. NAUCH.-ISSLED. INST. KHIM. SREDSTV. ZASHCH. RAST., SHCHELKOVO, USSR.

UNCLASSIFIED

Acc. Nr: AP0049130 Abstracting Service: CHEMICAL ABST. 5-70 Ref. Code: UR 0079

100792q Action of lithium carboranes on quaternary ammonium salts. Zakharkin, L. I.; Litovchenko, L. E.; Kazantsev, A. V. (USSR). *Zh. Obshch. Khim.* 1970, 40(1), 125–7 (Russ). To a soln. of methyl-*o*-carboranyllithium (I) in Et_2O-C_6H_6 (prepd. from 3.16 g methyl-*o*-carborane and BuLi) was added 5.7 g powd. 1-methylquinolinium iodide and the mixt. kept 1 hr at room temp. to give 82% 1-methyl-2-(methyl-*o*-carboranyl)-1,2-dihydroquinoline, m. 128–9°, which is stable in the solid state in air but develops a red color in soln. when heated. It is easily oxidized by iodine to the quinolinium iodide salt. Similarly was prepd. 76% 1-methyl-2-(*o*-carboranyl)-1,2-dihydroquinoline, m. 139–41°; and 86% 1-methyl-2-(phenyl-*o*-carboranyl)-1,2-dihydroquinoline, m. 155–7°. Dilithium-*m*-carborane gave 64% bis(1-methyl-1,2-dihydroquinoline)-*m*-carborane, m. 139.5–41°. A soln. of I and 1-methylpyridinium iodide similarly gave after brief heating 78% 1-methyl-4-(methyl-*o*-carboranyl)-1,4-dihydropyridine, m. 89–90°; similarly was prepd. 1-methyl-4-(phenyl-*o*-carboranyl)-1,4-dihydropyridine, m. 106–8°. These behaved similarly to the quinoline compds. above.
G. M. Kosolapoff

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REEL/FRAME
19800936

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USSR

UDC 547.743.1

SHEVCHENKO, V. I., and LITOVCHENKO, M. R., Institute of Organic Chemistry, Kiev, Academy of Sciences Ukrainian SSR

"Reaction of 1,1,2-Tricyano-2-arylalkanes With Phosphorus Pentachloride"

Kiev, Dopovidi Akademii Nauk Ukrainskoi RSR, Seriya B, No 2, Feb 70, pp 167-170

Abstract: Reaction of phosphorus pentachloride with 1,1,2-tricyano-2-arylalkanes in refluxing benzene yields acyclic trichlorophosphazo-1-chloro-2,3-dicyano-3-arylalkenes-1 (I). Reaction of PCl5 with 1,1,2-tricyano-2,2-diphenylethane is analogous. With a slight excess of water (I) hydrolyzes easily yielding 5-chloro-4-cyano-3-aryl-3-R-2-aminopyrrolines. Trichlorophosphazoalkenes add chlorine to form trichlorophosphazo-1,1,2-trichloro-2,3-dicyano-3-arylalkanes, which can be hydrolyzed to 1-chloro-1,1,2-tricyano-2-arylalkanes. Aminopyrrolines are colorless crystalline compounds soluble in acetone, alcohol, and dioxane, but insoluble in ether, benzene, hexane, and water; they are very weak bases. They dissolve in concentrated HCl forming hydrochlorides.

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USSR

UDC: 621.315.592

ZUYEV, V. A., LITOVCHENKO, V. G., GRINCHUK, K. D., LITOVCHENKO, N. N., SUKACH, G. A., and LINNIK, L. F.

"Current Carrier Recombination Processes on Ge and Si Surfaces Under Laser Excitation"

Leningrad, Fizika i tekhnika poluprovodnikov, No 10, 1972, pp 1936-1944

Abstract: While investigations of volume recombination processes of current carriers under laser excitation have been made and have yielded important information on the characteristics of local centers and new recombination mechanisms, investigations of surface processes have been limited to low excitation levels. The experiments described in this paper were designed to measure four effects: photoconductivity amplitude and relaxation time; absorption of infrared light by unbalanced current carriers; zone-zone recombination radiation intensity and relaxation; capacitor photo-emf. A block diagram of the experimental equipment is given. A neodymium laser operating at a wavelength of 1.06 microns and a ruby laser at 0.6943 microns, with maximum intensity of 10^{4} kW/cm^{2}·sec, were used to generate the unbalanced current carriers. A signal of

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ZUYEV, V. A., et al, Fizika i tekhnika poluprovodnikov, No 10, 1972, pp 1936-1944

infrared radiation was supplied by a 300 watt incandescent lamp with a germanium filter, and the receiver of the infrared radiation was a low-inertia photoresistance using germanium with a gold impurity. The authors thank O. V. Snitko, D. Pataki, and A. V. Sachenko for their useful comments on a number of problems encountered in the course of this work.

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TITLE--KINETICS OF THE PHOTOCONDUCTIVITY OF GALLIUM ARSENIDE -U-

AUTHOR-(03)-VOROBKALO, F.M., GLINCHUK, K.D., LITOVCHENKO, N.M.

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RELAXATION KINETICS OF THE PHOTOCOND. OF N AND P-GAAS, AT A PULSE DURATION OF 10 PRIME MEGATIVE6 SEC, WERE INVESTIGATED TO DET. PARAMETERS OF THE CENTERS CONTROLLING THE RECOMBINATION PROCESSES; STEADY PHOTOCOND. WAS STUDIED BY THE PHOTOCOND. MODULATION METHOD AND THE RESULTS WERE COMPARED WITH THE KINETIC DATA. THE REGULARITIES OBSD. WERE CONNECTED WTIH THE PROCESSES TAKING PLACE WITHIN THE CRYSTAL AND NOT ON ITS SURFACE. SHARPLY MONOPOLAR PHOTOCOND. OBSD. IS CONTROLLED BY A SYSTEM OF RAPID AND SLOW LEVELS. FOR 2 OF THEM (SLOW), THE CAPTURE CROSS SECTIONS FOR THE MAIN CHARGE CARRIERS (ELECTRONS IN N-GAAS AND VACANCIES IN P-GAAS), THE FRACTION OF CARRIERS RECOMBINING THROUGH EACH CENTER, IONIZATION ENERGIES OF THE CENTERS, AND CONCN. OF THE RECOMBINATION. CANALS DETG. THE PHOTOCOND, WERE DETD. THE MECHANISM OF ENERGY EMISSION DURING THE RECOMBINATION OF THE CARRIERS ON THE CENTERS IS NONRADIATIVE (SMALLER THAN OR EQUAL TO 0.01PERCENT CARRIERS RECOMBINE WITH A PHOTON EMISSION). THE RECOMBINATION CENTERS ARE VERY HEAT RESISTANT. FACILITY: INST. POLUPROV., KIEV, USSR.

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SHEVCHENKO, V. I., LITOVCHENCKO, N. R., KUKHAR', V. P., Institute of Organic Chemistry, Academy of Sciences Ukrainian SSR

"Phosphorylation of 1,1,2-Tricyanoalkanes with Phosphorus Pentachloride"

Leningrad, Zhurnal Obshchei Khimii, Vol 40, No 6, Jun 70, pp 1229-1234

Abstract: Trichlorophosphazopropylenes (I) which are obtained by the reaction of 1,1,2-tricyanoalkanes with PCl_5, easily add chlorine at the double bond to form trichlorophosphazo-1,1,2-trichloro-2,3-dicyano-3,3-dialkylpropanes. I yield cyclic compounds on hydrolysis. With excess water, they are hydrolyzed to 2-amino-3,3-dialkyl-4-cyano-5-chloropyrrolenes, whereas with a stoichiometric amount of water the hydrochlorides are obtained. Trichlorophosphazo-1-chloro-2,3-dicyano-3,3-dialkyl-1-propylenes react with chlorine to form trichlorophosphazo-1,1,2-trichloro-2,3-dicyano-3,3-dialkylpropanes which are hydrolyzed with excess water to yield 1-chloro-1,1,2-tricyanoalkanes.

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